



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 679 400 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
12.07.2006 Bulletin 2006/28

(51) Int Cl.:
D06F 37/02 (2006.01) D06F 37/06 (2006.01)

(21) Application number: **05015672.8**

(22) Date of filing: **19.07.2005**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**
Designated Extension States:
AL BA HR MK YU

(72) Inventors:
• **Kim, Young Ho**
Seoul (KR)
• **Kim, Dong Won**
Gwangmyeong-si
Gyeonggi-do (KR)

(30) Priority: **07.01.2005 KR 2005001713**

(74) Representative: **Schorr, Frank Jürgen et al**
Diehl & Partner,
Augustenstrasse 46
80333 München (DE)

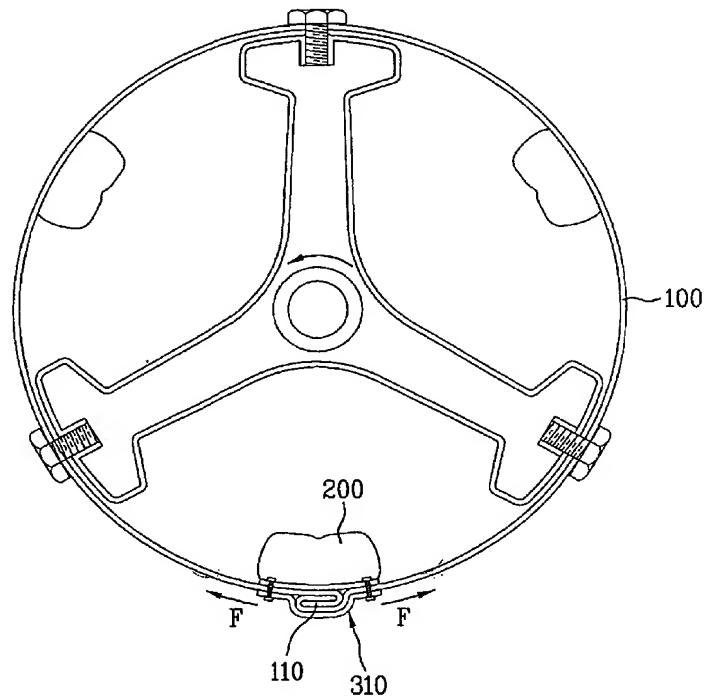
(71) Applicant: **LG ELECTRONICS INC.**
Seoul 150-721 (KR)

(54) **Drum of drum type washing machine**

(57) A drum washing machine has a seaming portion 110 of the drum 100 that is prevented from being unfolded or distorted even when the drum 100 is rotated at high

speed, by dispersing tension in a circumferential direction, which acts on the seaming portion 110. The seaming portion 110 is provided with a lift 200 to prevent the laundry from being damaged.

FIG. 6



EP 1 679 400 A1

Description

[0001] The present invention relates to a drum washing machine, and more particularly, to a drum of a drum washing machine, in which the drum has sufficient strength to be used in a drum washing machine of high speed and large volume.

[0002] Generally, a washing machine is utilized to wash the laundry based on action of flow of washing water and chemical action of detergents. The washing machine selectively or entirely performs washing, hot water washing, rinsing, and dehydrating (or drying) depending on user's selection.

[0003] Hereinafter, a drum of a related art drum washing machine will be described with reference to FIG. 1 to FIG. 5B.

[0004] Referring to FIG. 1 and FIG. 2, a drum 1 of the related art drum washing machine has a cylindrical shape. The drum 1 is provided with a plurality of through holes 1a to enable washing water to flow in and out. Both circumferential ends of the drum 1 are seamed to form a cylindrical shape. In this case, a seaming portion 10 of the drum 1 is formed in a direction substantially parallel to a rotational shaft of the drum 1.

[0005] As shown in FIG. 2, the seaming portion 10 protrudes on the outer circumference of the drum 1 and is pressurized by a punch at a predetermined interval to form a concave and convex shape.

[0006] The seaming portion 10 of the drum 1 will be described in more detail with reference to FIG. 3.

[0007] One circumferential end of the drum 1 is externally folded to form a folding portion 11, and the other circumferential of the drum 1 is internally folded to form a folding portion 12. The folding portions 11 and 12 are pressurized to comprise the seaming portion 10 when they are fitted into each other.

[0008] The aforementioned drum washes, rinses, and dehydrates (or dries) the laundry while being rotated by a driving gear.

[0009] When the drum 1 is rotated, tension F acts on the seaming portion 10 of the drum 1 in both circumferential directions as shown in FIG. 4. Particularly, great tension F acts on the seaming portion 10 during a dehydrating or drying process in which the drum 1 is rotated at high speed.

[0010] However, the drum of the related art drum washing machine has several problems.

[0011] First, since the drum has a structure that tension F remarkably acts on a portion P1 where an upper folding portion starts, a problem occurs in that the portion P1 may be unfolded as shown in a dotted line of FIG. 5A if tension F remarkably acts on the portion P1 for a long time.

[0012] Second, greater tension F acts on a portion P2 where the upper folding portion ends, as the portion P1 is unfolded as shown in the dotted line of FIG. 5A. Therefore, force F1 acts on the upper folding portion in a direction where a lower folding portion is unfolded as shown

in FIG. 5B. For this reason, a problem occurs in that a bent portion P3 of the lower folding portion is gradually unfolded as shown in FIG. 5B.

[0013] Third, since the seaming portion has weak rigidity, it is likely that the seaming portion is unfolded or distorted as described above. This makes the seaming portion difficult to be applied to or utilized in the drum of high speed and large volume.

[0014] Finally, since the lift is arranged to avoid the seaming portion, the laundry in the drum may be damaged due to snagging caused by the seaming portion when the drum is rotated.

[0015] Accordingly, the present invention is directed to provide a drum of a drum washing machine that substantially obviates one or more problems due to limitations and disadvantages of the related art.

[0016] An object of the present invention is to provide a drum of a drum washing machine in which a seaming portion of the drum is prevented from being unfolded or distorted and the drum can be used in a drum washing machine of high speed and large volume.

[0017] Another object of the present invention is to provide a drum of a drum washing machine in which the laundry is prevented from being damaged by a seaming portion during washing and drying cycles of the laundry.

[0018] Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

[0019] To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, a drum of a drum washing machine includes a body having a seaming portion whose both circumferential ends are connected with each other, and a reinforcing device fixed onto the seaming portion to disperse tension in a circumferential direction, which acts on the seaming portion.

[0020] Preferably, the reinforcing device includes reinforcing panels arranged on the seaming portion, and fitting members fitting the reinforcing panels to the body to disperse the tension into the reinforcing panels and the seaming portion.

[0021] Preferably, the fitting members are arranged at both circumferential sides around the seaming portion.

[0022] Preferably, the reinforcing panels are arranged on outer and inner surfaces of the seaming portion. Preferably, the reinforcing panels are arranged on either an inner surface or an outer surface of the seaming portion.

[0023] Preferably, the lift is arranged to correspond to the seaming portion of the body and the lift is provided with a groove to receive one end of each of the fitting members.

[0024] Preferably, the fitting members are fitted into

the lift through the body and the reinforcing panels to disperse the tension into the body, the reinforcing panels and the lift. Preferably, the fitting members pass through the body and the reinforcing panels to disperse the tension into the body and the reinforcing panels, and are not fitted into the lift.

[0025] Preferably, the fitting members are bolts or rivets.

[0026] In another aspect of the present invention, a drum of a drum washing machine includes a body having a seaming portion whose both circumferential ends are connected with each other, the seaming portion being externally protruded, a reinforcing device fixed onto the seaming portion to disperse tension in a circumferential direction, which acts on the seaming portion, and a lift arranged to correspond to the seaming portion.

[0027] In another aspect of the present invention, a drum of a drum washing machine includes a body having a seaming portion whose both circumferential ends are connected with each other. The seaming portion protrudes internally, a reinforcing device is fixed onto the seaming portion to disperse tension in a circumferential direction, which acts on the seaming portion, and a lift receiving the seaming portion therein.

[0028] In still another aspect of the present invention, a drum of a drum washing machine includes a body having a seaming portion whose both circumferential ends are connected with each other, the seaming portion internally protruding, and a lift receiving the seaming portion therein.

[0029] It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory but are nonlimiting and are intended to provide further explanation of the invention as claimed.

[0030] The present invention is further described in the detailed description which follows, with reference to the noted plurality of drawings by way of non-limiting examples of exemplary embodiments of the present invention, in which like reference numerals represent similar parts throughout the several views of the drawings, and wherein:

FIG. 1 is a side view illustrating a drum of a related art drum washing machine;

FIG. 2 is an enlarged view illustrating a seaming portion of a drum of FIG. 1;

FIG. 3 is a sectional view taken along line I-I of FIG. 2;

FIG. 4 is a sectional view illustrating the state that tension acts on the seaming portion as the drum of FIG. 1 is rotated;

FIG. 5A is a sectional view illustrating the state that tension acts on the seaming portion of FIG. 4;

FIG. 5B is a sectional view illustrating the state that the seaming portion is distorted as tension acts on the seaming portion of FIG. 4;

FIG. 6 is a sectional view illustrating a drum of a drum washing machine according to the first embodiment

of the present invention;

FIG. 7 is a sectional view illustrating a first example of a reinforcing device of FIG. 6;

FIG. 8 is a sectional view illustrating a fitting member constituting the reinforcing device of FIG. 6;

FIG. 9 is a sectional view illustrating another fitting member constituting the reinforcing device of FIG. 6;

FIG. 10 is a sectional view illustrating a second example of a reinforcing device of FIG. 6;

FIG. 11 is a sectional view illustrating a third example of a reinforcing device of FIG. 6;

FIG. 12 is a sectional view illustrating a drum of a drum washing machine according to the second embodiment of the present invention;

FIG. 13 is a sectional view illustrating a first example of a reinforcing device of FIG. 12;

FIG. 14 is a sectional view illustrating a second example of a reinforcing device of FIG. 12;

FIG. 15 is a sectional view illustrating a third example of a reinforcing device of FIG. 12; and

FIG. 16 is a sectional view illustrating a portion of a drum of a drum washing machine according to the third embodiment of the present invention.

[0031] The following will explain, with reference to the above-described drawings, preferred embodiments of the present invention, in which like characters represent like elements. The particulars shown herein are by way of illustrative example of the embodiments of the invention only and are presented in the cause of providing what is believed to be the most useful and readily understood description of the principles and conceptual versions of the present invention. In this regard, no attempt is made to show structural details of the invention in more detail than is necessary for the fundamental understanding of the present invention, the description taken with the drawings making apparent to those skilled in the art how the several forms of the present invention may be embodied in practice.

[0032] A drum of a drum washing machine according to the first embodiment of the present invention will be described with reference to FIG. 6.

[0033] The drum includes a body 100 having a seaming portion 110 whose both circumferential ends are connected with each other, and a reinforcing device 310 fixed onto the seaming (or seam) portion 110 to disperse tension F in a circumferential direction, which acts on the seaming portion.

[0034] The seaming portion 110 is provided in such a manner that the circumferential ends of the body 100 are connected to each other when they are bent. The seaming portion 110 may be bent in various shapes without being limited to the configuration of FIG. 6. For example, both circumferential ends may be connected with each other such that they are bent twice or more.

[0035] The seaming portion 110 is protruded at the outer side of the body 100.

[0036] In this case, a lift 200 is preferably arranged to

correspond to an inner side of the seaming portion 110. The lift 200 is to prevent the laundry from being damaged by shag (a snag) generated when the laundry contacts the seaming portion 110. The lift 200 has a filled inner portion or a hollow inner portion.

[0037] The reinforcing device 310 is provided to surround the seaming portion 110. Various examples of the reinforcing device 310 will be described below.

[0038] The first example of the reinforcing means 310 will be described in more detail with reference to FIG. 7.

[0039] The reinforcing device 310 includes reinforcing panels 311 and 312 sequentially arranged on the seaming portion 110, and a fitting member 313 provided at both circumferential ends of the reinforcing panels to disperse tension F circumferentially acting on the body 100 between the reinforcing panels 311 and 312 and the seaming portion 110.

[0040] The reinforcing panels 311 and 312 are sequentially arranged on inner and outer surfaces of the seaming portion 110. Preferably, the reinforcing panels 311 and 312 have a width (circumferential length) greater than that of the seaming portion 110. This is to allow the reinforcing panels 311 and 312 to surround the seaming portion 110. In addition, both circumferential sides of the reinforcing panels 311 and 312 have a predetermined thickness to avoid distortion or splitting. The thickness of the reinforcing panels is determined while considering tension and volume of the drum.

[0041] At this time, the lift 200 is preferably arranged to cover the reinforcing panel 312. This is to prevent the laundry from being damaged by the reinforcing panel 312 arranged on the inner surface of the seaming portion 110.

[0042] Preferably, the reinforcing panels 311 and 312 and the body 100 are made of the same material as each other in view of elasticity and contractile force, so that tension of the body 100 may be dispersed more efficiently. However, it is to be understood that the reinforcing panels 311 and 312 may be made of a material different from that of the body 100 in view of elasticity and contractile force.

[0043] Furthermore, the fitting member 313 is fitted into the lift 200 through the reinforcing panels 311 and 312 and the body 100. A plurality of fitting members 313 are arranged at both circumferential sides of the seaming portion 110 along a length direction of the seaming portion.

[0044] As an example of the fitting member 313, a nut is fixed to the lift 200 and then a bolt is fitted into the nut. In this case, no separate fitting member is required to fix the lift 200 to the body 100 of the drum. Also, it is possible to prevent the fitting member 313 from being protruded toward the inner surface of the body 100.

[0045] Although not shown, it is to be understood that a bolt may directly be fixed to the lift. Similarly other types of fitting members may be used.

[0046] Referring to FIG. 8, another fitting member 315 constituting the reinforcing device will be described.

[0047] The fitting member 315 pass through the rein-

forcing panels 311 and 312 and the body 100 but is not fitted to the lift 200. A groove 201 is formed at one side of the lift 200 toward the body to receive one end of the fitting member 313. Bolt and nut are used as the fitting member 315.

[0048] In case of such reinforcing panels 311 and 312 as shown in FIG. 8, little of the tension of the body 100 is transferred to the lift 200.

[0049] Referring to FIG. 9, another fitting member 316 constituting the reinforcing device will be described.

[0050] A rivet is used as the fitting member 316. Since the fitting member 316 of FIG. 9 is substantially equal to that of FIG. 8 except that the rivet is used as the fitting member, its description will be omitted. It is to be understood that the rivet may be used in a structure that the groove of FIG. 8 is formed.

[0051] In addition, the rivet passes through the reinforcing panels 311 and 312 and the body 100 but is not fitted into the lift 200.

[0052] In case of such reinforcing panels 311 and 312 as shown in FIG. 9, little of the tension of the body 100 is transferred to the lift 200.

[0053] The operation of the drum according to the first embodiment of the present invention will now be described.

[0054] Tension F of the drum acts on the reinforcing device 310 along both circumferential sides. Particularly, great tension acts on the reinforcing device 310 during a drying cycle in which the drum is rotated at high speed.

[0055] At this time, tension F is dispersed into the reinforcing panels 311 and 312, the seaming portion 110 and/or the lift 200 by the fitting members 313, 315, and 316.

[0056] For example, if the fitting member 313 is fitted into the reinforcing panels 311 and 312, the body 100 and the lift 200 as shown in FIG. 7, tension F is dispersed into the reinforcing panels 311 and 312, the body 100 and the lift 200 ($F=F_1+F_2+F_3+F_4$).

[0057] In addition, if the fitting members 315 and 316 are fitted into the reinforcing panels 311 and 312 and the body 100 as shown in FIG. 8 and FIG. 9, tension F is dispersed into the reinforcing panels 311 and 312 and the body 100 ($F=F_1+F_2+F_3$).

[0058] Finally, since tension is dispersed by the reinforcing device 310, only some tension F2 acts on the seaming portion 110 as shown in FIG. 7 to FIG. 9.

[0059] Meanwhile, since the outer reinforcing panel 311 surrounds the outer surface of the seaming portion 110 and the inner reinforcing panel 312 surrounds the inner surface of the seaming portion 110, it is possible to prevent the seaming portion from being unfolded.

[0060] Further, since the inner reinforcing panel 312 is almost parallel to a direction of tension of the body 100, the inner reinforcing panel 312 can absorb tension of the body 100 more than the outer reinforcing panel 311 and the seaming portion 110.

[0061] Further, since the fitting members 313, 315, and 316 and the inner reinforcing panel 312 are not exposed

to the inner portion of the drum due to the lift 200, it is possible to prevent the laundry from contacting the fitting members 313, 315 and 316 and the reinforcing panel 312. Therefore, the laundry can be prevented from being damaged.

[0062] A second example of the reinforcing device will be described with reference to FIG. 10.

[0063] In the second example, the reinforcing panel 321 is arranged on the outer surface of the seaming portion 110. Therefore, the reinforcing means 320 is comprised of an outer reinforcing panel 321 and a fitting member 323.

[0064] Since the reinforcing panel 321 surrounds the outer surface of the seaming portion 110 and the lift 200 surrounds the inner surface of the seaming portion 110, it is possible to prevent the seaming portion 110 from being unfolded.

[0065] Further, since the reinforcing device 320 is fixed to the outer side of the drum in a state that the lift 200 is fixed, assembly time can remarkably be reduced. As described above, the fitting member 323 may fit or secure the reinforcing panel 321, the body 100 and the lift 200 or may fit or secure the reinforcing panel 321 and the body 100 only.

[0066] Tension F of the drum is dispersed into the outer reinforcing panel 321 and the seaming portion 110 ($F=F_1+F_2$). The outer reinforcing panel 321 not only disperses tension but also prevents the seaming portion 110 from being unfolded.

[0067] A third example of the reinforcing device will be described with reference to FIG. 11.

[0068] In the third example, the reinforcing panel 332 is arranged on the inner surface of the seaming portion 110. Therefore, the reinforcing device 330 is comprised of an inner reinforcing panel 332 and a fitting member 333.

[0069] Since the inner reinforcing panel 332 is substantially parallel to a direction of tension F of the body 100, the inner reinforcing panel 332 can absorb tension of the body 100 more than the seaming portion 110. In this respect, the third example of the reinforcing device is more efficient than the second example in absorbing tension.

[0070] Further, the fitting member 333 may fit or secure the reinforcing panel 332, the body 100 and the lift 200 or may fit or secure the reinforcing panel 332 and the body 100 only.

[0071] Tension F of the drum is dispersed into the inner reinforcing panel 332 and the seaming portion 110 ($F=F_1+F_2$).

[0072] A drum of a drum washing machine according to the second embodiment of the present invention will be described with reference to FIG. 12.

[0073] The drum includes a body 100 having a seaming portion 110 whose both circumferential ends are connected with each other, the seaming portion 110 being internally protruded, a reinforcing device 410 is fixed onto the seaming portion 110 to disperse tension F in a cir-

cumferential direction, which acts on the seaming portion 110, and a lift 200 receives the seaming portion 110 therein.

[0074] The lift 200 is provided with a receiving groove 210 to receive the seaming portion 110. It is to be understood that no separate receiving groove is required if the lift has a hollow structure.

[0075] The reinforcing device 410 includes reinforcing panels 411 and 412 arranged on the seaming portion 110, and a fitting member 413 (see FIG. 13) to fit or secure the reinforcing panels to the body 100 to disperse tension F, which acts on the body in a circumferential direction, is provided between the reinforcing panels and the seaming portion.

[0076] Various examples of the reinforcing device 410 will be described below.

[0077] A first example of the reinforcing device 410 will be described with reference to FIG. 13.

[0078] The reinforcing panels 411 and 412 are arranged to surround outer and inner surfaces of the seaming portion 110. In other words, the inner reinforcing panel 412 surrounds the inner surface of the seaming portion 110 while the outer reinforcing panel 411 surrounds the outer surface of the seaming portion 110. The protruded portion of the inner reinforcing panel 412 contacts the receiving groove 210 of the lift 200. Therefore, the lift 200 not only prevents the seaming portion 110 and the inner reinforcing panel 412 from being directly contacted with the laundry but also prevents the seaming portion from being unfolded.

[0079] Since the fitting member 413 is the same as that of the drum according to the first embodiment, its description will be omitted.

[0080] A second example of the reinforcing device will be described with reference to FIG. 14.

[0081] A reinforcing panel 421 is arranged to surround the outer surface of the seaming portion 110. In this case, since the seaming portion 110 contacts the receiving groove 210 of the lift 200, the lift 200 not only prevents the seaming portion 110 from being unfolded but also prevents the seaming portion 110 from being contacted with the laundry.

[0082] A fitting member 423 is fitted into the lift 200 through the reinforcing panel 421 and the body 100. Also, the fitting member 423 may not be fitted into the lift 200.

[0083] A third example of the reinforcing device will be described with reference to FIG. 15.

[0084] A reinforcing panel 432 is arranged to surround the inner surface of the seaming portion 110. In this case, the seaming portion 110 and the protruded portion of the reinforcing panel 432 are received in the receiving groove 210 of the lift 200.

[0085] A fitting member 433 is fitted into the lift 200 through the reinforcing panel 432 and the body 100.

[0086] A drum of a drum washing machine according to the third embodiment of the present invention will be described with reference to FIG. 16.

[0087] The drum includes a body 100 having a seam-

ing portion 110 whose both circumferential ends are connected with each other, the seaming portion being internally protruded, and a lift 200 receiving the seaming portion 110 therein.

[0088] Preferably, the lift 200 is provided with a receiving groove 210 to receive the seaming portion 110.

[0089] In the third embodiment unlike the first and second embodiments, the lift 200 can prevent the seaming portion 110 from being unfolded or distorted without a separate reinforcing device. The third embodiment is different from the first and second embodiments in that tension acting on the seaming portion 110 is dispersed into the lift 200 only.

[0090] As described above, the drum of the drum washing machine according to the present invention has the following advantages.

[0091] First, in the first and second embodiments, since tension of the body is dispersed by the reinforcing device, tension acting on the seaming portion can remarkably (i.e., significantly) be reduced.

[0092] Second, in the first and second embodiments, since tension acting on the seaming portion is reduced, the drum can be used in the drum washing machine of high speed and large volume.

[0093] Third, in the first, second and third embodiments, since the lift is arranged to cover the seaming portion and the fitting member, it is possible to prevent the laundry from being damaged by the seaming portion and the fitting member.

[0094] Finally, in the third embodiment, it is possible to prevent the seaming portion from being unfolded or distorted without a separate reinforcing means.

[0095] It is noted that the foregoing examples have been provided merely for the purpose of explanation and are in no way to be construed as limiting of the present invention. While the present invention has been described with reference to exemplary embodiments, it is understood that the words which have been used herein are words of description and illustration, rather than words of limitation. The present teachings can be readily applied to other types of apparatuses. Changes may be made, within the purview of the appended claims, as presently stated and as amended, without departing from the scope and spirit of the present invention in its versions. Although the present invention has been described herein with reference to particular structures, materials and embodiments, the present invention is not intended to be limited to the particulars disclosed herein; rather, the present invention extends to all functionally equivalent structures, methods and uses, such as are within the scope of the appended claims. Alternative structures discussed for the purpose of highlighting the invention's advantages do not constitute prior art unless expressly so identified. No one or more features of the present invention are necessary or critical unless otherwise specified.

[0096] Accordingly, a drum washing machine is provided, having a seaming portion of the drum that is prevented from being unfolded or distorted even when the

drum is rotated at high speed, by dispersing tension in a circumferential direction, which acts on the seaming portion. The seaming portion is provided with a lift to prevent the laundry from being damaged.

Claims

1. A drum of a drum washing machine comprising:

a body (100) having a seam portion (110), both circumferential ends of the body being connected with each other at the seam portion (110); and a reinforcing device (310; 320; 330; 410; 420; 430) fixed to the seam portion (110) to disperse, in a circumferential direction, tension acting on the seam portion (110).

2. A drum of a drum washing machine comprising:

a body (100) having a seam portion (110), both circumferential ends of the body (100) being connected with each other at the seam portion (110), the seam portion (110) protruding externally of the body (100); a reinforcing device (310; 320; 330) fixed onto the seam portion (110) to disperse tension, which acts on the seam portion (110), in a circumferential direction; and a lift (200) arranged in correspondence to the seam portion (110).

3. A drum of a drum washing machine comprising:

a body (100) having a seam portion (110), both circumferential ends of the body (100) being connected with each other at the seam portion (110), the seam portion (110) protruding internally of the body; a reinforcing device (410; 420; 430) fixed onto the seam portion (110) to disperse tension, which acts on the seaming portion (110), in a circumferential direction; and a lift (200) receiving the seam portion (110) therein.

4. The drum according to claim 3, wherein the lift (200) is provided with a receiving groove (210) to receive the seam portion (110).

5. The drum according to one of claims 1 to 4, wherein the reinforcing device includes:

reinforcing panels (311, 312; 321; 332; 411, 412; 421; 432) positioned on the seam portion (110); and fitting members (313; 315; 316; 323; 413; 423; 433) fitting the reinforcing panels (311, 312; 321;

332; 411, 412; 421; 432) with the body to (100) disperse the tension into the reinforcing panels (311, 312; 321; 332; 411, 412; 421; 432) and the seaming portion (110).

5

6. The drum according to claim 5, wherein the fitting members (313; 315; 316; 323; 413; 423; 433) are positioned at both circumferential sides around the seam portion (110).

10

7. The drum according to claim 5 or 6, wherein the reinforcing panels (311, 312; 321; 332; 411, 412; 421; 432) are positioned on outer and inner surfaces of the seam portion (110).

15

8. The drum according to claim 5 or 6, wherein the reinforcing panels (311, 312; 321; 332; 411, 412; 421; 432) are positioned on either an inner surface or an outer surface of the seam portion (110).

20

9. The drum according to one of claims 5 to 8, wherein a lift (200) is arranged in correspondence to the seam portion (110) of the body (100).

10. The drum according to claim 9, wherein the fitting members (313; 315; 316; 323; 413; 423; 433) are fitted into the lift (200) through the body (100) and the reinforcing panels (311, 312; 321; 332; 411, 412; 421; 432) to disperse the tension into the body (100), the reinforcing panels (311, 312; 321; 332; 411, 412; 421; 432) and the lift (200).

25

30

11. The drum according to claim 9 or 10, wherein the fitting members (313; 315; 316; 323; 413; 423; 433) pass through the body (100) and the reinforcing panels (311, 312; 321; 332; 411, 412; 421; 432) to disperse the tension into the body (100) and the reinforcing panels (311, 312; 321; 332; 411, 412; 421; 432), without being fitted into the lift (200).

35

40

12. The drum according to claim 11, wherein the lift (200) is provided with a groove (201) to receive one end of each of the fitting members (313; 315; 316; 323; 413; 423; 433).

45

13. The drum according to one of claims 5 to 12, wherein the fitting members (313; 315; 316; 323; 413; 423; 433) are bolts or rivets.

14. A drum of a drum washing machine comprising:

50

a body (100) having a seam portion (110), both circumferential ends of the body (100) being connected with each other at the seam portion (110), the seam portion (110) being configured to protrude internally of the body (100); and a lift (200) receiving the seam portion therein.

55

15. A washing machine having a drum according to one of claims 1 to 14.

FIG. 1
Related Art

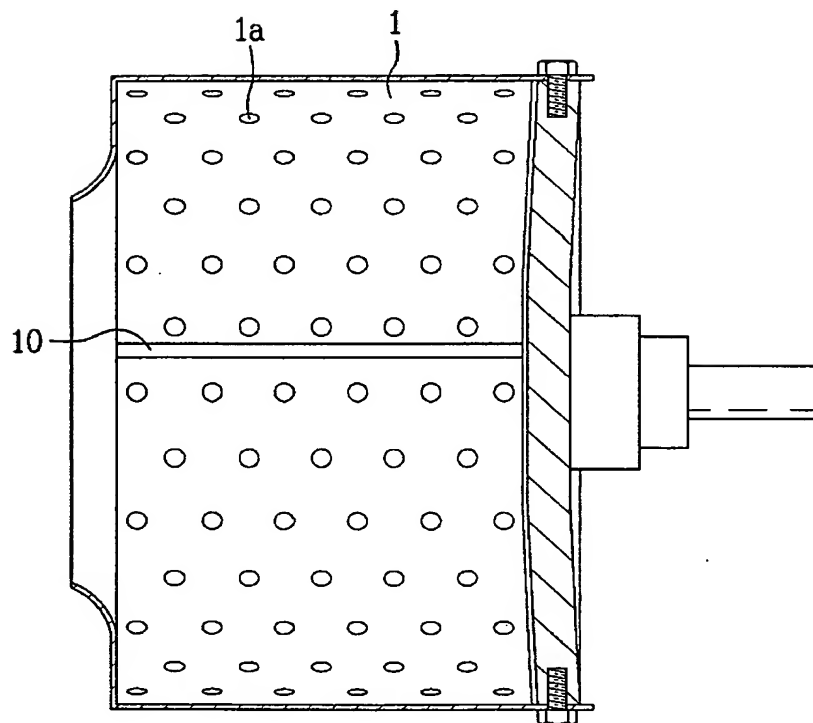


FIG. 2
Related Art

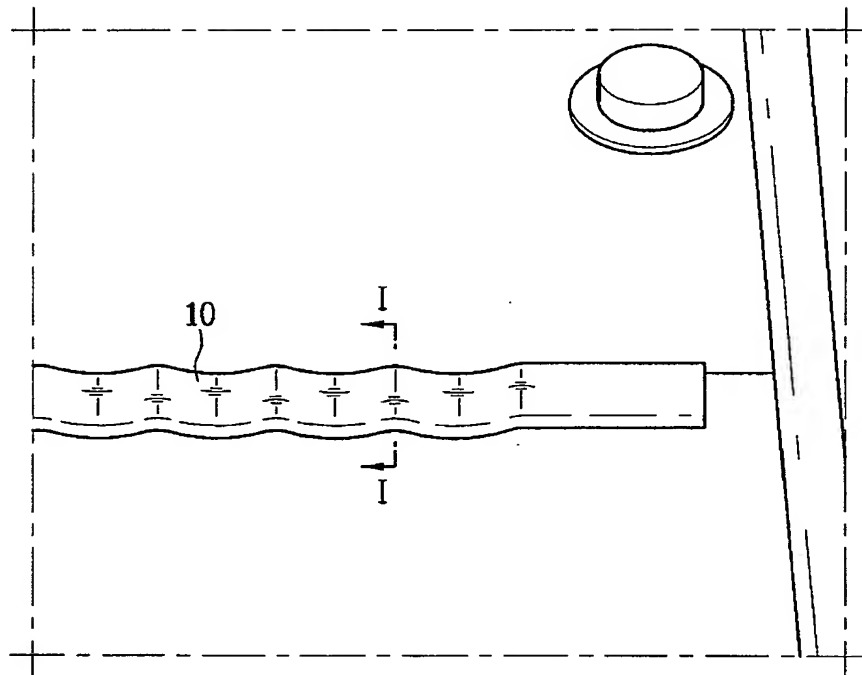


FIG. 3
Related Art

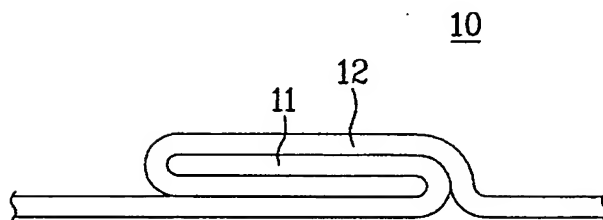


FIG. 4
Related Art

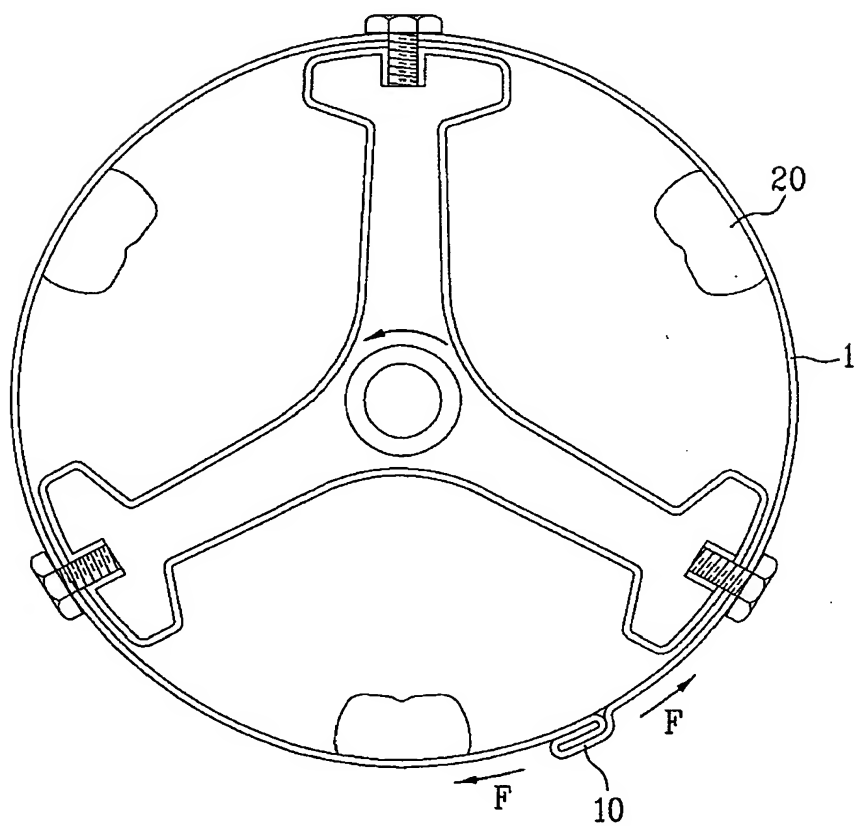


FIG. 5A
Related Art

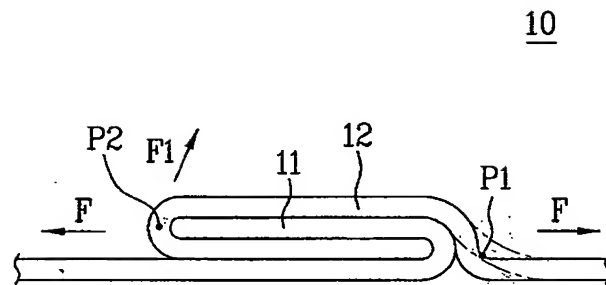


FIG. 5B
Related Art

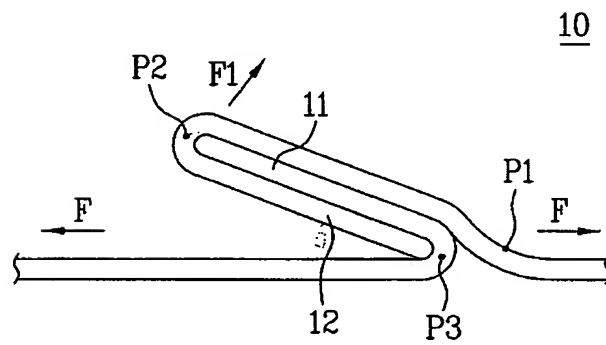


FIG. 6

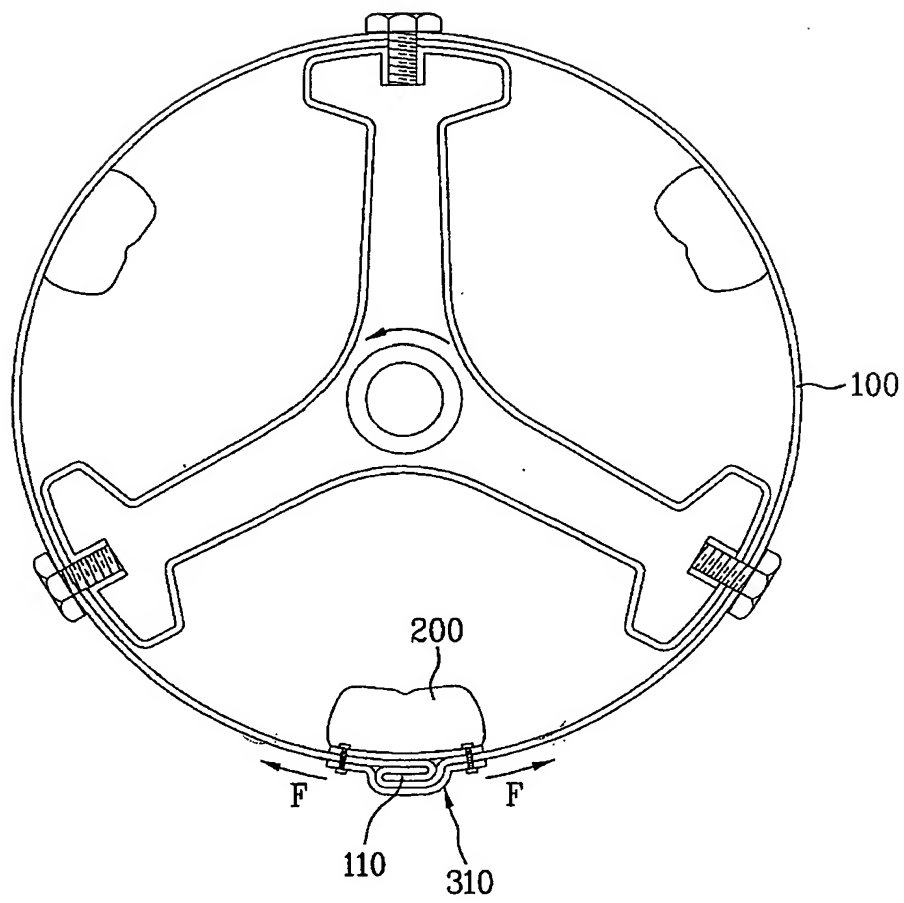


FIG. 7

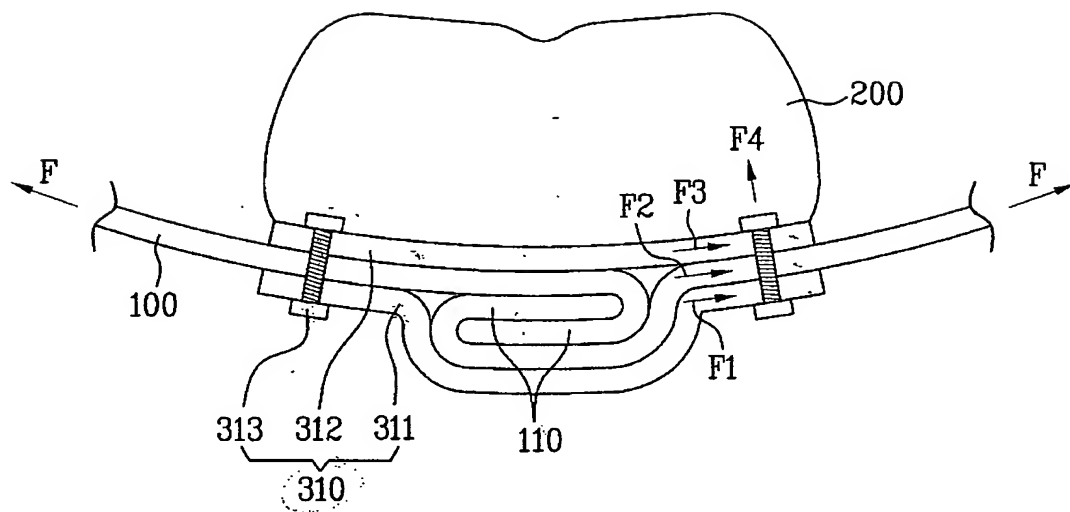


FIG. 8

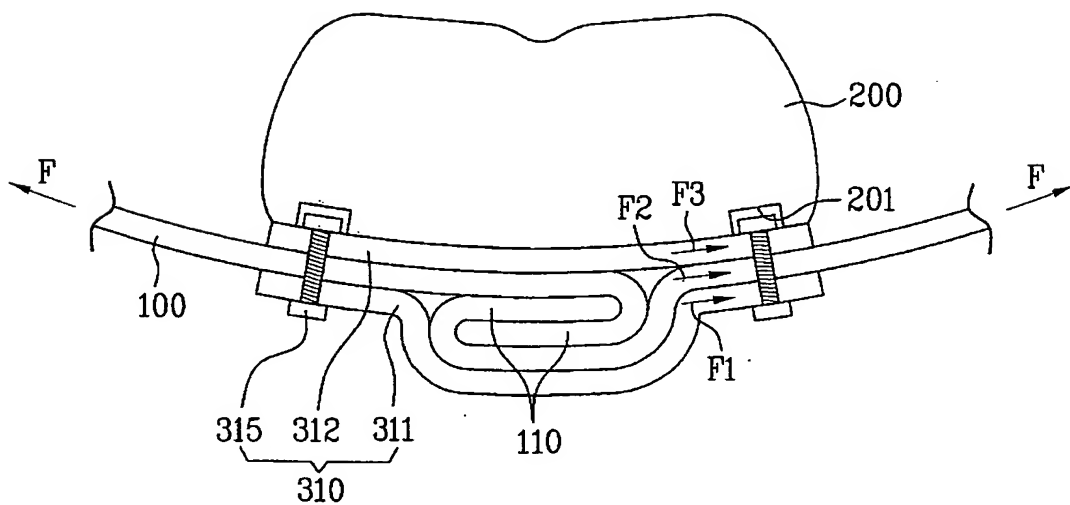


FIG. 9

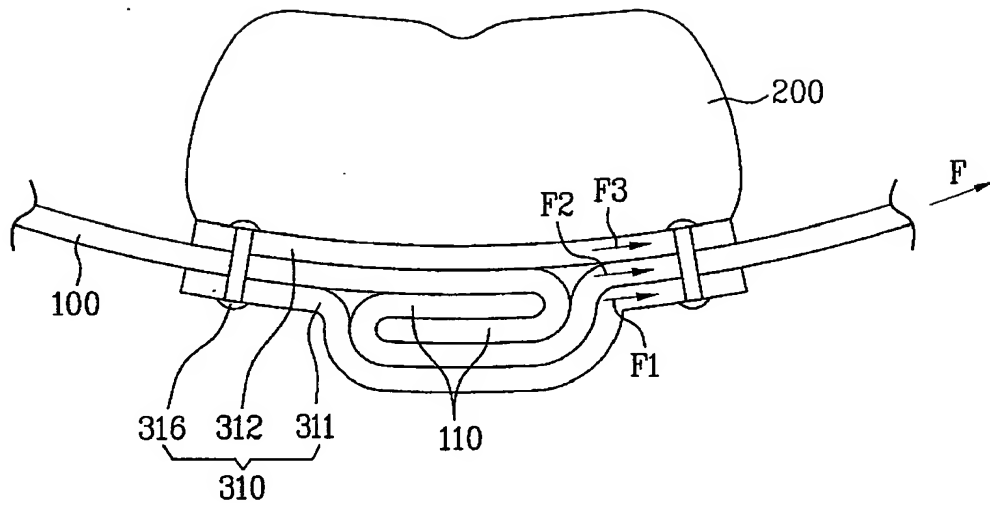


FIG. 10

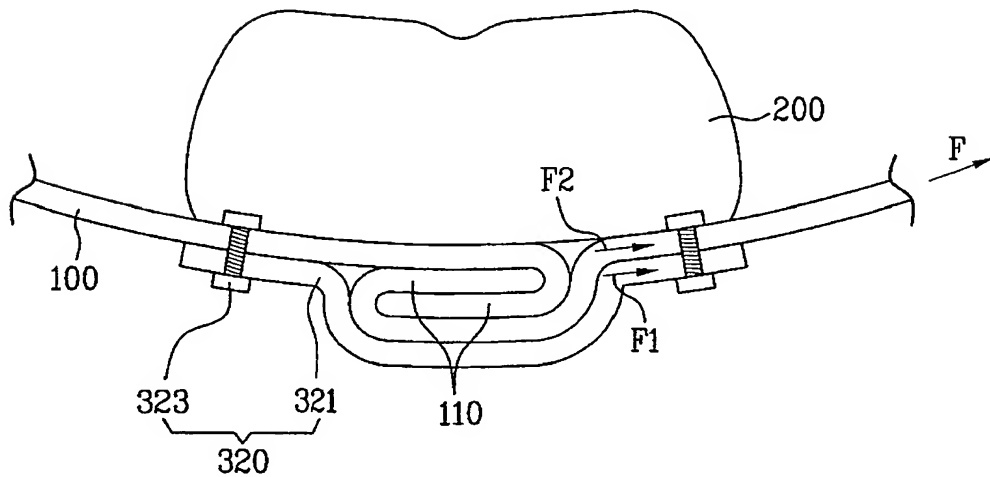


FIG. 11

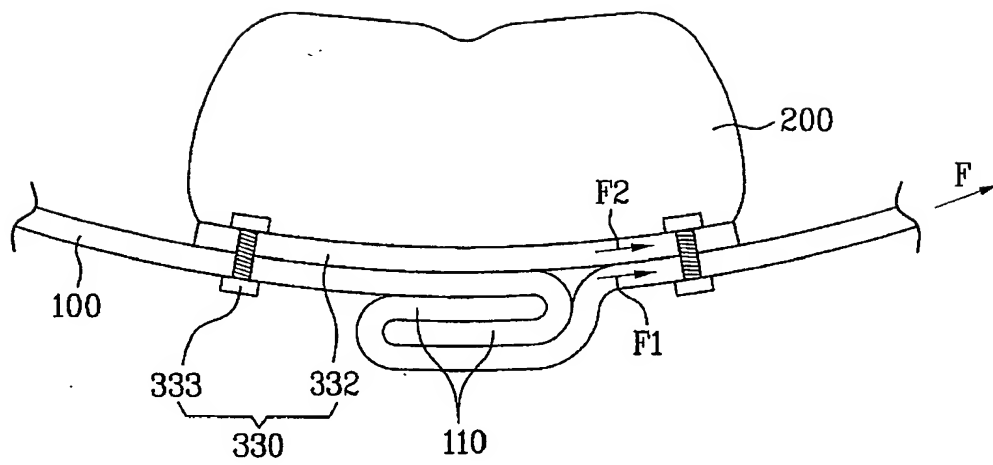


FIG. 12

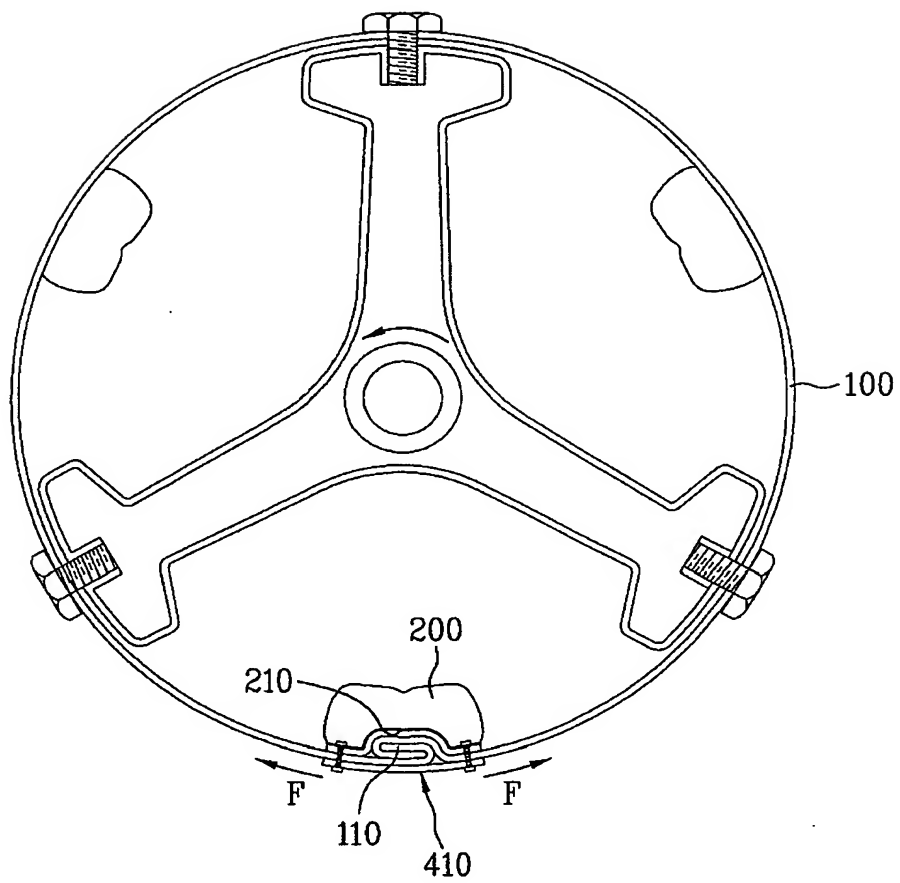


FIG. 13

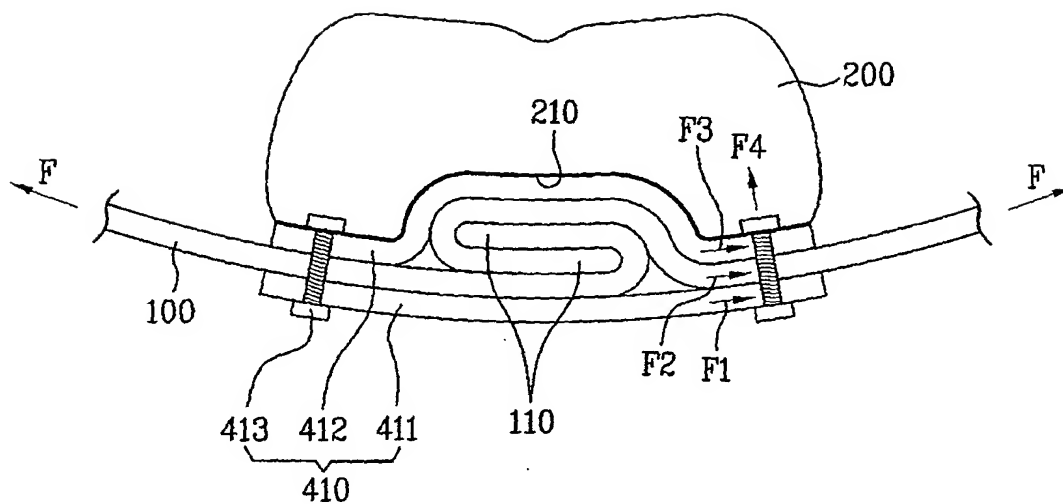


FIG. 14

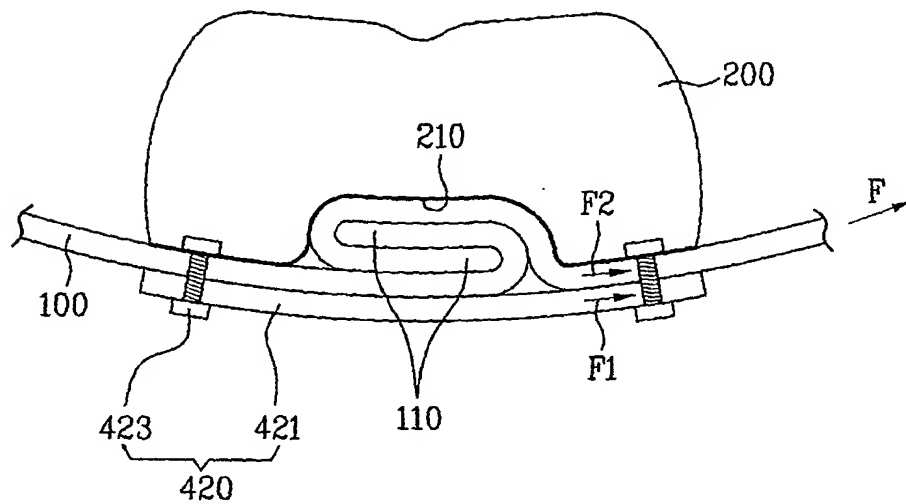


FIG. 15

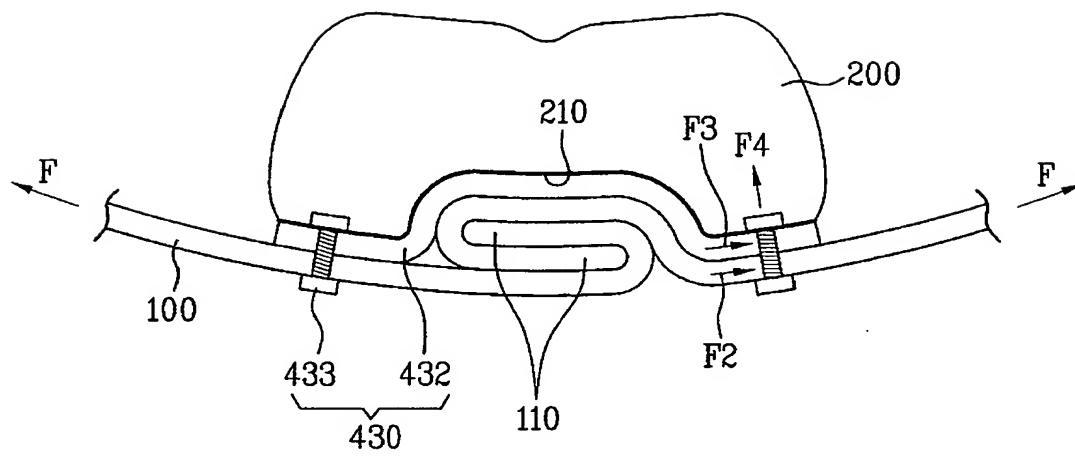
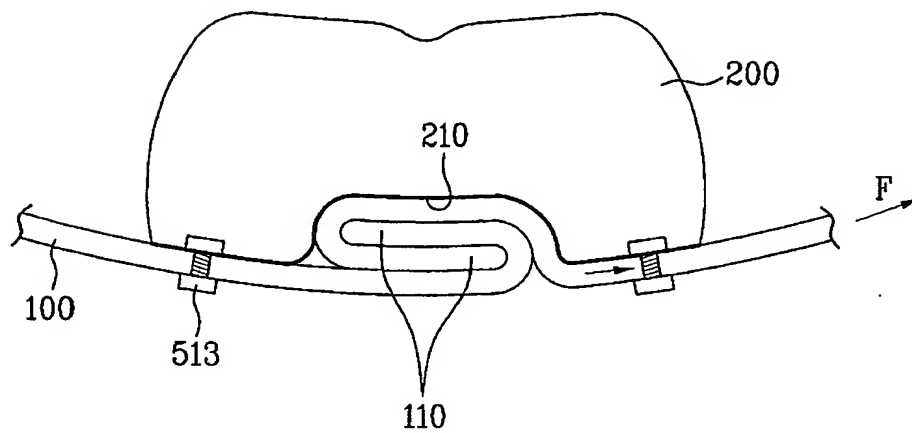


FIG. 16





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 01 5672

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2004/129036 A1 (RATFISCH UWE) 8 July 2004 (2004-07-08) * abstract * * page 1, paragraphs 3,10 * * page 2, paragraphs 12,13,24-29 * * page 3, paragraph 30; figures * -----	1-6, 8-10, 13-15	INV. D06F37/02 D06F37/06
X	DE 100 06 975 A1 (BSH BOSCH UND SIEMENS HAUSGERAETE GMBH) 30 August 2001 (2001-08-30) * the whole document *	1,2,5,6, 8,9,11, 15	
A	----- * the whole document *	3,4,7, 10,14	
X	DE 30 23 234 A1 (MIELE & CIE GMBH & CO; MIELE & CIE GMBH & CO, 4830 GUETERSLOH, DE) 7 January 1982 (1982-01-07) * the whole document *	1-4,14, 15	
A	----- DE 102 58 786 A1 (BSH BOSCH UND SIEMENS HAUSGERAETE GMBH) 24 July 2003 (2003-07-24) * the whole document *	1-3,14, 15	TECHNICAL FIELDS SEARCHED (IPC)
A	----- DE 19 36 017 U (CONSTRUCTA-WERKE G.M.B.H.) 7 April 1966 (1966-04-07) * claims; figures *	1-4,14, 15	D06F B21C B21D
A	----- CH 32 335 A (FIRMA: EMIL NEHER) 15 July 1905 (1905-07-15) * the whole document *	1-3,13, 14	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 April 2006	Examiner Falkentoft, C
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

1
EPO FORM 1503 03.02 (P/04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 01 5672

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-04-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004129036 A1	08-07-2004	DE 10259059 A1 EP 1431438 A1 PL 364096 A1	22-07-2004 23-06-2004 28-06-2004
DE 10006975 A1	30-08-2001	AT 286999 T WO 0161098 A2 EP 1257708 A2 ES 2236198 T3 PL 365826 A1	15-01-2005 23-08-2001 20-11-2002 16-07-2005 10-01-2005
DE 3023234 A1	07-01-1982	DK 240581 A SE 8102155 A	22-12-1981 22-12-1981
DE 10258786 A1	24-07-2003	CN 1608156 A DE 10163186 C1 WO 03054274 A1 EP 1458918 A1 US 2005005654 A1	20-04-2005 06-02-2003 03-07-2003 22-09-2004 13-01-2005
DE 1936017 U	07-04-1966	NONE	
CH 32335 A	15-07-1905	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

PUB-NO: EP001679400A1
DOCUMENT-IDENTIFIER: EP 1679400 A1
TITLE: Drum of drum type washing machine
PUBN-DATE: July 12, 2006

INVENTOR-INFORMATION:

NAME	COUNTRY
KIM, YOUNG HO	KR
KIM, DONG WON	KR

ASSIGNEE-INFORMATION:

NAME	COUNTRY
LG ELECTRONICS INC	KR

APPL-NO: EP05015672
APPL-DATE: July 19, 2005

PRIORITY-DATA: KR20050001713A (January 7, 2005)

EUR-CL (EPC): D06F037/02 , D06F037/06

ABSTRACT:

CHG DATE=20060714 STATUS=O>A drum washing machine has a seaming portion 110 of the drum 100 that is prevented from being unfolded or distorted even when the drum 100 is rotated at high speed, by dispersing tension in a circumferential

direction, which acts on the seaming portion 110. The seaming portion 110 is provided with a lift 200 to prevent the laundry from being damaged.